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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/838,235	04/20/2001	Laurence M. Hubby JR.	10007342-1	9228

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EXAMINER	
WANG, GEORGE Y	

ART UNIT	PAPER NUMBER
2871	

DATE MAILED: 04/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/838,235	HUBBY, LAURENCE M.	
	Examiner	Art Unit	
	George Y. Wang	2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 January 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15 and 21-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15 and 21-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 April 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-14 and 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Check, III (U.S. Patent No. 5,463,491, hereafter "Check") in view of Silverstein et al (U.S. Patent No. 6,339,463, hereafter "Silverstein").

3. As to claims 11, 21, and 23, Check disclose a visual image display (alphanumeric display, col. 1, lines 39-40) with a liquid light valve suspension in which a plurality of small particles are dispersed (col. 2, lines 53-55) (which therefore makes it a suspended particle light valve device) and the particles are capable of reflecting and absorbing light (col. 3, lines 19-21), a pair of electrodes (fig. 5, ref. 28) on the opposite surfaces (fig. 5) and the dependence of the orientation of the particles with the application of the electric field (fig. 9a, 9b) where Fig. 9A has no electric field applied and Fig. 9B shows the alignment of the particles with the applied electric field (col. 11, lines 50-62).

However, the reference fails to specifically disclose a fiber-optic faceplate.

Silverstein discloses a non-polarizer based color reflective LCD using a fiber-optic faceplate (fig. 6a, ref: 50) and a polymer dispersed liquid crystal (fig. 6a, ref. 40) underneath the faceplate and above the substrate (fig. 6a, ref. 30). Due to the nature of the polymer dispersed LC material, Silverstein's LC material can also be considered to be particles suspended in suspension (Figs. 4-5) and where the alignment of the particles or droplets with the application of the electric field (Figs. 5A-5B).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included a fiber-optic faceplate to the Check device since one would be motivated to enhance light collection efficiency and viewing angle performance. The fiber-optic faceplate also improves overall off-specular viewing performance and chromaticity and effective reflected luminance for larger viewing angles and may eliminate noticeable inhomogenities (col. 3, lines 22-37).

4. As per claims 1-2, Check discloses the display as recited above with a pair of electrodes and the orientation of the particles with an electric field (fig. 9a-9b; col. 11, lines 50-62), however, the reference fails to specifically disclose a fiber-optic faceplate having an upper face, a lower face, and multiplicity of straight optical fibers positioned between the upper and lower face and the longitudinal axes of the optical fibers are parallel to each other and substantially perpendicular to the upper and lower faces and the collection and projection of light rays from a light source..

Silverstein disclose that the fiber-optic faceplate has an upper face, a lower face, and multiplicity of straight optical fibers positioned between the upper and lower face

and the longitudinal axes of the optical fibers are parallel to each other and substantially perpendicular to the upper and lower faces (Figs. 6a and 6b) and the collection and projection of light rays from a light source (fig. 6, ref. 60; col. 5, lines 10-15) and a transparent conductive layer (ITO, col. 5, lines 7-9).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included a fiber-optic faceplate of Silverstein to the Check device since one would be motivated to enhance light collection efficiency and viewing angle performance. The fiber-optic faceplate also improves overall off-specular viewing performance and chromaticity and effective reflected luminance for larger viewing angles and may eliminate noticeable inhomogenities (col. 3, lines 22-37).

5. Regarding claims 3 and 12, Check discloses the display as recited above, with perimeter seals (fig. 6, ref. 15).

6. As to claims 4, 5, 13 and 14, Check discloses the display as recited above where the orientation of the particles with the electric field and the transparency of the light rays in Fig. 9B and the opacity of the light and the randomization of the particles in Fig. 9A.

7. As per claims 8-9, Check discloses the display as recited above where a light vale having a film with particles suspended in droplets of a liquid light valve suspension

(col. 2, lines 21-39). Check also discloses a film, a fluid (col. 2, lines 25-26; col. 15, lines 34-52).

8. Regarding claim 10, Check discloses the display as recited above having an index matching fluid (col. 19, lines 65-67).

9. As to claims 22, Check discloses the display as recited above where the suspension (fig. 5, ref. 24) is between the first and second electrodes (fig. 5, ref. 28).

10. Claims 6, 15, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Check in view of Silverstein, in further view of Ishii et al (U.S. Patent No. 5,148,297, hereafter "Ishii").

Check, when modified by Silverstein, discloses the color display device as recited above, however, the references fail to specifically disclose color filters positioned on a rear substrate.

Ishii disclose an LCD device with fiber optic faceplate elements with a color filer (fig. 8, ref. 15a; col. 2, lines 54-55) on a rear substrate, positioned underneath the LC cell. Furthermore, Ishii notes that the color filter can be positioned at various locations in the device (col. 6, lines 14-18).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have color filters positioned on a rear substrate since one would be motivated to attain a greater color effect in portable display devices such color TVs,

personal computers and laptops, projection type TVs or display for meeting presentation (col. 4, lines 46-51).

11. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Check in view of Silverstein, in further view of Hubby, Jr. et al (U.S. Patent No. 5,181,130, hereafter "Hubby").

Check, when modified by Silverstein, discloses the color display device as recited above where the optical faceplate includes an array of individual optical fibers that are fused and cut and polished to a desired thickness to form a plate (Silverstein, col. lines 5-9), however, the references fail to specifically disclose the cut dimensions of the fiber-optic faceplate, namely in the range of approximately 0.25 to 5.0 mm.

Hubby discloses a fiber optic faceplate (ref. 619) for LCD that can be fabricated to a thickness in the range of 0.7 to 5.0 millimeters, preferably about 3.0 millimeters (col. 8, lines 28-30).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a fiber-optic faceplate with a thickness in the range of approximately 0.25 to 5.0 mm since one would be motivated to provide increased brightness than conventional devices under a wide range of ambient lighting conditions due to the superior light diffusion characteristics of such a faceplate (col. 5, lines 50-55).

12. Claims 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Check in view of Ishii.

Check discloses the suspended particle device as recited above, however, the reference fails to specifically disclose either a color filter on a substrate or a fiber-optic faceplate and a means for sealing the SPD to the faceplate.

Ishii disclose a substrate (fig. 4, ref. 11b), a liquid crystal layer (fig. 4, ref. 13b), fiber-optic faceplate (fig. 4, ref. 16) on the LC layer, and a sealing compound (fig. 4, ref. 12) to seal the SPD to the faceplate that would allow motion of the faceplate relative to the SPD depending on the viscosity of the compound (col. 3, lines 62-67).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have a color filter and sealing means of Ishii in the Check device since one would be motivated to attain a greater color effect in portable display devices such color TVs, personal computers and laptops, projection type TVs or display for meeting presentation (col. 4, lines 46-51).

Response to Arguments

13. Applicant's arguments filed January 3, 2005 have been fully considered but they are not persuasive.

Applicant's main argument is that the prior art references cited to not teach or suggest the combination as suggested in the Office Action above. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the

time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). In this case, it is clear that the Silverstein reference provides more than adequate motivation for combining the faceplate to the device of Check since one would be motivated to enhance light collection efficiency and viewing angle performance. The fiber-optic faceplate also improves overall off-specular viewing performance and chromaticity and effective reflected luminance for larger viewing angles and may eliminate noticeable inhomogenities (Silverstein, col. 3, lines 22-37). Furthermore, the Ishii reference provides sufficient motivation to suggest the color filter structure and position since one would be motivated to attain a greater color effect in portable display devices such color TVs, personal computers and laptops, projection type TVs or display for meeting presentation (Ishii, col. 4, lines 46-51). As a result, the combinations are not "just filling in the gaps" as Applicant's suggest. Rather, they are sound combinations supported by the prior art references themselves.

Applicant further argues that the Office Action assumes that a liquid crystal layer is considered to be a suspended particle device and requests a document or affidavit for "Examiner's personal knowledge." However, such a document is not necessary since the prior art reference clearly indicate that an LC layer is essentially an SPD. First, from the claim language itself, there is nothing that distinguishes a suspended particle device from that of an LCD. It is well known in the art at LC molecules are particles that are suspended within an LC layer, whose orientation controls light absorption and reflection upon the application of an electric field. Second, the prior art reference, namely Check,

clearly disclose a visual image display with a liquid light valve suspension in which a plurality of small particles are dispersed (col. 2, lines 53-55) (which therefore makes it a suspended particle light valve device) and the particles are capable of reflecting and absorbing light (col. 3, lines 19-21) (see also Check col. 3, lines 19-53 and rejection above).

Lastly, with regard to claim 26, Applicant argues that the "flexibility" of the sealing compound is "pure fabrication," Examiner disagrees. The fact that Ishii teaches that the faceplate can be formed separately formed and then put together at point C (col. 3, lines 62-67), it is clear that a sealing compound with lower viscosity would provide for greater motion.

As a result, Applicant's arguments are not persuasive and Examiner holds to the validity of the references used to maintain rejection.

Conclusion

14. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to George Y. Wang whose telephone number is 571-272-2304. The examiner can normally be reached on M-F, 8 am - 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H. Kim can be reached on 571-272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

gw
April 18, 2005

ROBERT H. KIM
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